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- Derwent World Patents Index (for users in Japan) (File 352)
- Derwent World Patents Index First View (File 331)
- Derwent World Patents Index (File 351)
- Derwent World Patents Index (File 350)
- Ei EnCompassPat (File 353)
- European Patents Fulltext (File 348)
- French Patents (File 371)
- German Patents Fulltext (File 324)
- IMS Patent Focus (File 447, 947)
- INPADOC/Family and Legal Status (File 345)
- JAPIO - Patent Abstracts of Japan (File 347)
- LitAlert (File 670)
- U.S. Patents Fulltext (1971-1975) (File 652)

- U.S. Patents Fulltext (1976-present) (File 654)
- WIPO/PCT Patents Fulltext (File 349)
- TRADEMARKSCAN - U.S. Federal (File 226)

DialogLink 5 Release Notes
New features available in the latest release of DialogLink 5 (August 2006)

- Ability to resize images for easier incorporation into DialogLink Reports
- New settings allow users to be prompted to save Dialog search sessions in the format of their choice (Microsoft Word, RTF, PDF, HTML, or TEXT)
- Ability to set up Dialog Alerts by Chemical Structures and the addition of Index Chemicus as a structure searchable database
- Support for connections to STN Germany and STN Japan services

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? Help Log On Msg
           *** ANNOUNCEMENTS ***
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in selected patent and trademark files.  Combined with the
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histories give you the most complete view of a patent or trademark
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histories you need.  See HELP FILEHIST for more information about
how to use the link and a list of files that contain the link.

***The 2008 EMTREE Thesaurus has been added to EMBASE (Files 72, 73,
772, and 972)***

RESUMED UPDATING
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***File 120, U.S. Copyrights
                    ***
RELOADS COMPLETED
***File 50, CAB Abstracts
***File 162, Global Health
***File 342, Patents Citation Index
***File 227, TRADEMARKSCAN(R) - Community Trademarks
                    ***
FILES RENAMED
***fILE 321, PLASPEC now known as Plastic Properties Database
                    ***
FILES REMOVED
***Files 476/Financial Times & 473/Financial Times Abstracts
***Files 359,959,804,  Chemical Economics Handbook
***Files 360,960, Specialty Chemicals Update Program
                    ***
>>>For the latest news about Dialog products, services, content<<<
>>>and events, please visit What's New from Dialog at          <<<
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>>>a specific database by entering HELP NEWS <file number>.    <<<

? Help Off Line
* * *
Connecting to Suzanne Noakes - Dialog - 276629
Connected to Dialog via SMS003341137

?  b 155 biosci medicine 399
>>>W:            44 is unauthorized
          76 is unauthorized
         138 is unauthorized
3 of the specified files are not available
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[File 155] MEDLINE(R) 1950-2008/Aug 08

[File 5] Biosis Previews(R) 1926-2008/Aug W1

[File 24] CSA Life Sciences Abstracts 1966-2008/Sep

[File 28] Oceanic Abstracts 1966-2008/Sep

[File 34] SciSearch(R) Cited Ref Sci 1990-2008/Aug W1

[File 35] Dissertation Abs Online 1861-2008/Apr

[File 40] Enviroline(R) 1975-2008/Apr

[File 41] Pollution Abstracts 1966-2008/Sep

[File 45] EMCare 2008/Jul W4

[File 50] CAB Abstracts 1973-2008/Aug W1

**File 50: The file has been reloaded and accession numbers have changed. See HELP NEWS50 for information.*

[File 65] Inside Conferences 1993-2008/Aug 11

[File 71] ELSEVIER BIOBASE 1994-2008/Jul W2

[File 73] EMBASE 1974-2008/Aug 07

[File 91] MANTIS(TM) 1880-2008/Aug

[File 98] General Sci Abs 1984-2008/Jul

[File 110] WasteInfo 1974-2002/Jul

**File 110: This file is closed (no updates)*

[File 135] NewsRx Weekly Reports 1995-2008/Aug W1

[File 136] BioEngineering Abstracts 1966-2007/Jan

**File 136: This file is closed.*

[File 143] Biol. & Agric. Index 1983-2008/Jul

[File 144] Pascal 1973-2008/Aug W1

[File 164] Allied & Complementary Medicine 1984-2008/Aug

[File 172] EMBASE Alert 2008/Aug 08

[File 185] Zoological Record Online(R) 1864-2008/Jul

**File 185: The file has been reloaded to add archive records back to 1864. Accession numbers have changed.*

[File 357] Derwent Biotech Res. _1982-2008/Jul W2

[File 369] New Scientist 1994-2008/Jun W5

[File 370] Science 1996-1999/Jul W3

**File 370: This file is closed (no updates). Use File 47 for more current information.*

[File 391] Beilstein Database - Reactions 2007/Q4

[File 434] SciSearch(R) Cited Ref Sci 1974-1989/Dec

[File 467] ExtraMED(tm) 2000/Dec

[File 149] TGG Health&Wellness DB(SM) 1976-2008/Jul W3

[File 156] ToxFile 1965-2008/Aug W1

[File 159] Cancerlit 1975-2002/Oct

[File 162] Global Health 1983-2008/Aug W1

**File 162: The file has been reloaded and accession numbers have changed. See HELP NEWS 162 for information.*

[File 266] FEDRIP 2008/May

[File 399] CA SEARCH(R) 1967-2008/UD=14906

**File 399: Use is subject to the terms of your user/customer agreement. IPCR/8 classification codes now searchable as IC=. See HELP NEWSIPCR.*

[File 444] New England Journal of Med. 1985-2008/May W1

```
?  s (copolymer or co-polymer)(n60)(hydrophilic)(n60)(hydrophobic)
        469252   COPOLYMER
          1064   CO-POLYMER
        193851   HYDROPHILIC
        457898   HYDROPHOBIC
S1        3171   S (COPOLYMER OR CO-POLYMER)(N60)(HYDROPHILIC)(N60)(HYDROPHOBIC)


?  s ((protein copolymer) or (protein co-polymer))(n60)(hydrophilic)(n60)(hydrophobic)
             0   PROTEIN COPOLYMER
             0   PROTEIN CO-POLYMER
        193851   HYDROPHILIC
        457898   HYDROPHOBIC
S2           0   S ((PROTEIN COPOLYMER) OR (PROTEIN CO-
POLYMER))(N60)(HYDROPHILIC)(N60)(HYDROPHOBIC)


?
?  s s1 and protein
Processing
Processing
          3171   S1
      13028717   PROTEIN
S3         425   S S1 AND PROTEIN


?  s s3 and (ELP or elastin)
           425   S3
          2318   ELP
         46911   ELASTIN
S4          23   S S3 AND (ELP OR ELASTIN)


?  rd
>>>W:  Duplicate detection is not supported for File 391.
Records from unsupported files will be retained in the RD set.
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S5 16 RD (UNIQUE ITEMS)

? t s5/medium/all

5/3/1 (Item 1 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

17500491 PMID: 17238231
Thermoresponsive self-assembly of short elastin-like polypentapeptides and their poly(ethylene glycol) derivatives.

Pechar Michal; Brus Jiri; Kostka Libor; Konak Cestmir; Urbanova Martina; Slouf Miroslav
Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, 162 06 Prague 6, Czech Republic. pechar@imc.cas.cz
Macromolecular bioscience (Germany) Jan 5 2007 , 7 (1) p56-69 , ISSN: 1616-5187--Print Journal Code: 101135941
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

5/3/2 (Item 2 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

17231075 PMID: 16953644
Micelle density regulated by a reversible switch of protein secondary structure.

Sallach Rory E; Wei Min; Biswas Nilanjana; Conticello Vincent P; Lecommandoux Sebastien; Dluhy Richard A; Chaikof Elliot L
Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA.

Journal of the American Chemical Society (United States) Sep 13 2006 , 128 (36) p12014-9 , ISSN: 0002-7863--Print Journal Code: 7503056
Contract/Grant No.: EB001956; EB; United States NIBIB; HL60464; HL; United States NHLBI; HL71336; HL; United States NHLBI
Publishing Model Print
Document type: Journal Article; Research Support, N.I.H., Extramural
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

5/3/3 (Item 1 from file: 34)
Fulltext available through: STIC Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

17325729 Genuine Article#: 251ZW No. References: 67
In situ cross-linkinig of elastin-like polypeptide block copolymers for tissue repair

Author: Lim DW; Nettles DL; Setton LA; Chilkoti A (REPRINT)
Corporate Source: Duke Univ,Dept Biomed Engn,Box 90281/Durham//NC/27708 (REPRINT); Duke Univ,Dept Biomed Engn,Durham//NC/27708
Journal: BIOMACROMOLECULES , 2008 , V 9 , N1 (JAN) , P 222-230
ISSN: 1525-7797 Publication date: 20080100
Publisher: AMER CHEMICAL SOC , 1155 16TH ST, NW, WASHINGTON, DC 20036 USA
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

5/3/4 (Item 1 from file: 35)
Dissertation Abs Online

01741167 ORDER NO: AADAA-I9968377
Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

Author: Lee, Terrence Anita-Talley
Degree: Ph.D.
Year: 2000
Corporate Source/Institution: Emory University (0665)
Source: Volume 6104B of Dissertations Abstracts International.
PAGE 1973 . 106 PAGES

5/3/5 (Item 1 from file: 71)
Fulltext available through: STIC Full Text Retrieval Options
ELSEVIER BIOBASE

03988946 2008038926
In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

Lim D.W.; Nettles D.L.; Setton L.A.; Chilkoti A.
Address: A. Chilkoti, Department of Biomedical Engineering, Duke University, Box 90281, Durham, NC 27708-0281 , United States
Email: chilkoti@duke.edu
Journal : Biomacromolecules , 9/1 (222-230) , 2008 , United States
CODEN: BOMAF
ISSN: 1525-7797
Document Type: Article
Languages: English Summary Languages: English

No. of References: 67

CLASSIFICATION CODE AND DESCRIPTION:
Modlecular Sequence Databank Number: 82.12.4.2 - PROTEIN BIOCHEMISTRY / OTHER PROTEINS / Structural Proteins / Elastin

5/3/6 (Item 1 from file: 135)
NewsRx Weekly Reports

0000647990 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Recent findings from Georgia Institute of Technology, U.S., highlighted

Biotech Business Week, October 8, 2007, p.2387

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1047

5/3/7 (Item 2 from file: 135)
NewsRx Weekly Reports

0000597426 (USE FORMAT 7 OR 9 FOR FULLTEXT)

New research results reported by researchers with Georgia Institute of Technology, U.S.

Biotech Business Week, August 20, 2007, p.2565

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
938

5/3/8 (Item 3 from file: 135)
NewsRx Weekly Reports

0000575859 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Results of recent studies reported by Georgia Institute of Technology, U.S.

Life Science Weekly, July 31, 2007, p.5727

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1299

5/3/9 (Item 4 from file: 135)
NewsRx Weekly Reports

0000551447 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Study findings from Georgia Institute of Technology, U.S., are outlined in reports

Science Letter, June 26, 2007, p.4081

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
820

5/3/10 (Item 5 from file: 135)
NewsRx Weekly Reports

0000531151 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., researchers publish most recent findings

Biotech Business Week, May 28, 2007, p.1693

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1417

5/3/11 (Item 6 from file: 135)
NewsRx Weekly Reports

0000514629 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Research from Georgia Institute of Technology, U.S., provides new insights into human health

Pharma Business Week, May 7, 2007, p.2453

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1452

5/3/12 (Item 7 from file: 135)

NewsRx Weekly Reports

0000503440 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Study data released by Georgia Institute of Technology, U.S.

Biotech Business Week, April 23, 2007, p.1821

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1373

5/3/13 (Item 8 from file: 135)
NewsRx Weekly Reports

0000479681 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., researchers summarize new study results

Biotech Business Week, March 26, 2007, p.1226

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
1609

5/3/14 (Item 9 from file: 135)
NewsRx Weekly Reports

0000440121 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Georgia Institute of Technology, U.S., investigators have published new study data

Biotech Business Week, February 12, 2007, p.1430

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
833

5/3/15 (Item 10 from file: 135)
NewsRx Weekly Reports

0000428537 (USE FORMAT 7 OR 9 FOR FULLTEXT)

New biomedical engineering study findings recently were published by researchers at Georgia Institute of Technology, Department of Biomedical Engineering

Obesity, Fitness & Wellness Week, February 10, 2007, p.511

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
343

5/3/16 (Item 11 from file: 135)
NewsRx Weekly Reports

0000356587 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Micelle density is regulated by reversible protein secondary

structure

Gene Therapy Weekly, November 9, 2006, p.105

DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
332

? TYPE 1741167/full from 35

1741167/9 (Direct type from file: 35)
Dissertation Abs Online

01741167 ORDER NO: AADAA-I9968377
Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

Author: Lee, Terrence Anita-Talley
Degree: Ph.D.
Year: 2000
Corporate Source/Institution: Emory University (0665)
Adviser: Vincent P. Conticello
Source: Volume 6104B of Dissertations Abstracts International.
PAGE 1973 . 106 PAGES
Descriptors: CHEMISTRY, POLYMER ; ENGINEERING, MATERIALS SCIENCE ; BIOLOGY, MOLECULAR
Descriptor Codes: 0495; 0794; 0307

The overall goal in material science is to be able to control the molecular architecture of a material and thus its end properties. There is no method that offers greater control than the biological synthesis of proteins. From the DNA sequence to the final synthesized protein, the entire process is finitely controlled. This present work describes methods developed and used to synthesize protein polymers by manipulating this process. From the initial DNA sequence chosen, the end properties that the protein polymer will have are dictated. An amphiphilic diblock copolymer was designed based on environmentally responsive elastin-mimetic peptide sequences [(Val/Ile)-Pro-Gly-Xaa-Gly] (Xaa = Ala or Glu for the hydrophilic block, Val or Phe for the hydrophobic block) and synthesized using a genetic engineering approach. Differential scanning calorimetry measurements in aqueous solution revealed that reversible hydrophobic folding and assembly of the copolymer occurs above the inverse temperature transition, <italic>T_t</italic>, of the hydrophobic block. This process results in the formation of 50 nm protein-based micellar aggregates, which were characterized by electron microscopy and temperature-dependent dynamic light scattering techniques. The distribution of micellar aggregates can be altered reproducibly through variation of environmental conditions including pH and temperature. The uniform and defined macromolecular architecture of this protein copolymer permits greater control over the physical properties of the micelles, which therefore may

facilitate applications in controlled release of small molecules.

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?  d s

Set      Items   Description

S1        3171   S (COPOLYMER OR CO-POLYMER)(N60)(HYDROPHILIC)(N60)(HYDROPHOBIC)

S2           0   S ((PROTEIN COPOLYMER) OR (PROTEIN CO-
POLYMER))(N60)(HYDROPHILIC)(N60)(HYDROPHOBIC)

S3         425   S S1 AND PROTEIN

S4          23   S S3 AND (ELP OR ELASTIN)

S5          16   RD  (unique items)


?  t s5/full/1-5
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5/9/1 (Item 1 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

17500491 PMID: 17238231
Thermoresponsive self-assembly of short elastin-like polypentapeptides and their poly(ethylene glycol) derivatives.

Pechar Michal; Brus Jiri; Kostka Libor; Konak Cestmir; Urbanova Martina; Slouf Miroslav
Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, 162 06 Prague 6, Czech Republic. pechar@imc.cas.cz
Macromolecular bioscience (Germany) Jan 5 2007 , 7 (1) p56-69 , ISSN: 1616-5187--Print Journal Code: 101135941
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS
Short polypeptides with four pentad repeats, (VPGVG)(4) and (VPAVG)(4), were synthesised by manual fluorenylmethoxycarbonyl/tert-butyl (Fmoc/t-Bu) solid phase peptide synthesis using a convergent approach. In the next step, the peptides were coupled via their N-terminus with activated semi-telechelic poly(ethylene glycol) O-(N-Fmoc-2-aminoethyl)-O'-(2-carboxyethyl)undeca(ethylene glycol) (Fmoc-PEG-COOH) to yield monodisperse Fmoc-PEG-peptide diblock copolymer. Both the presence of the terminal hydrophobic Fmoc group and the hydrophilic PEG chain in the copolymers were shown to play a crucial role in their self-associative behaviour, leading to reversible formation of supramolecular thermoresponsive assemblies. The peptides and their PEG derivatives were characterised by HPLC, NMR and MALDI-TOF MS. The associative behaviour of the peptides and their PEG derivatives was studied by dynamic light scattering, MAS NMR and phase contrast microscopy. [image: see text]
Descriptors: *Elastin--chemistry--CH; *Peptides--chemistry--CH; *Polyethylene Glycols--chemistry--CH ; Amino

Acid Sequence; Chromatography, High Pressure Liquid; Magnetic Resonance Spectroscopy; Microscopy, Phase-Contrast; Models, Molecular; Oligopeptides--chemical synthesis--CS; Oligopeptides--chemistry--CH; Protein Conformation; Scattering, Radiation; Spectrometry, Mass, Matrix-Assisted Laser Desorption-Ionization; Thermodynamics
CAS Registry No.: 0 (Oligopeptides); 0 (Peptides); 0 (Polyethylene Glycols); 9007-58-3 (Elastin)
Record Date Created: 20070129
Record Date Completed: 20070403

5/9/2 (Item 2 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

17231075 PMID: 16953644
Micelle density regulated by a reversible switch of protein secondary structure.

Sallach Rory E; Wei Min; Biswas Nilanjana; Conticello Vincent P; Lecommandoux Sebastien; Dluhy Richard A; Chaikof Elliot L
Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA.
Journal of the American Chemical Society (United States) Sep 13 2006 , 128 (36) p12014-9 , ISSN: 0002-7863--Print Journal Code: 7503056
Contract/Grant No.: EB001956; EB; United States NIBIB; HL60464; HL; United States NHLBI; HL71336; HL; United States NHLBI
Publishing Model Print
Document type: Journal Article; Research Support, N.I.H., Extramural
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS
Protein secondary structures may exhibit reversible transitions that occur in an abrupt and controllable manner. In this report, we demonstrate that such transitions may be utilized in the design of a "smart" protein micellar system, in which a stimulus-induced change in protein structure triggers a rapid change in micelle compacticity and size. Specifically, recombinant DNA methods were used to prepare a protein triblock copolymer containing a central hydrophilic block and two hydrophobic end blocks derived from elastin-mimetic peptide sequences. Below the copolymer inverse transition temperature (T(t)), dilute solutions of this amphiphilic protein formed monodispersed micelles in a narrow range of R(H) of approximately 100 nm. When the the temperature was raised above T(t), an abrupt increase in micelle internal density was observed with a concomitant reduction in micelle size. This reversible change in micelle compacticity was triggered by helix-to-sheet protein folding transition. Significantly, these protein polymer-based micelles, which are rapidly responsive to environmental stimuli, establish a new mechanism for the design of controlled drug delivery vehicles.
Descriptors: *Elastin--chemistry--CH; *Peptides--chemistry--CH ; Amino Acid Sequence; Biomimetic Materials--chemistry--CH; Circular Dichroism; Light; Micelles; Molecular Sequence Data; Protein Structure, Secondary; Recombinant Proteins--chemistry--CH; Scattering, Radiation
CAS Registry No.: 0 (Micelles); 0 (Peptides); 0 (Recombinant Proteins); 9007-58-3 (Elastin)
Record Date Created: 20060906

Record Date Completed: 20070815

5/9/3 (Item 1 from file: 34)
Fulltext available through: STIC Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

17325729 Genuine Article#: 251ZW Number of References: 67
In situ cross-linkinig of elastin-like polypeptide block copolymers for tissue repair

Author: Lim DW; Nettles DL; Setton LA; Chilkoti A (REPRINT)
Corporate Source: Duke Univ,Dept Biomed Engn,Box 90281/Durham//NC/27708 (REPRINT); Duke Univ,Dept Biomed Engn,Durham//NC/27708
Journal: BIOMACROMOLECULES , 2008 , V 9 , N1 (JAN) , P 222-230
ISSN: 1525-7797 Publication date: 20080100
Publisher: AMER CHEMICAL SOC , 1155 16TH ST, NW, WASHINGTON, DC 20036 USA
Language: English Document Type: ARTICLE
Geographic Location: USA
Journal Subject Category: BIOCHEMISTRY & MOLECULAR BIOLOGY; CHEMISTRY, ORGANIC; POLYMER SCIENCE
Abstract: Rapid cross-linking of elastin-like polypeptides (ELPs) with hydroxymethylphosphines (HMPs) in aqueous solution is attractive for minimally invasive in vivo implantation of biomaterials and tissue engineering scaffolds. In order to examine the independent effect of the location and number of reactive sites on the chemical cross-linking kinetics of ELPs and the mechanical properties of the resulting hydrogels, we have designed ELP block copolymers comprised of cross-linkable, hydrophobic ELP blocks with periodic Lys residues (A block) and aliphatic, hydrophilic ELP blocks with no cross-linking sites (B block); three different block architectures, A, ABA, and BABA were synthesized in this study. All ELP block copolymers were rapidly cross-linked with HMPs within several minutes under physiological conditions. The inclusion of the un-cross-linked hydrophilic block, its length relative to the cross-linkable hydrophobic block, and the block copolymer architecture all had a significant effect on swelling ratios of the cross-linked hydrogels, their microstructure, and mechanical properties. Fibroblasts embedded in the ELP hydrogels survived the cross-linking process and remained viable for at least 3 days in vitro when the gels were formed from an equimolar ratio of HMPs and Lys residues of ELPs. DNA quantification of the embedded cells indicated that the cell viability within triblock ELP hydrogels was statistically greater than that in the monoblock gels at day 3. These results suggest that the mechanical properties of ELP hydrogels and the microenvironment that they present to cells can be tuned by the design of the block copolymer architecture.
Identifiers-- KeyWord Plus(R): PROTEIN-BASED POLYMERS; EXTRACELLULAR-MATRIX PROTEINS; RECOMBINANT PROTEIN; MECHANICAL-PROPERTIES; PHYSICAL-PROPERTIES; ESCHERICHIA-COLI; DRUG-DELIVERY; CELL-ADHESION; HYDROGELS; BIOMATERIALS
Cited References:
BELLINGHAM CM, 2003, V70, P445, BIOPOLYMERS
BERNING DE, 1999, V121, P1658, J AM CHEM SOC
BETRE H, 2002, V3, P910, BIOMACROMOLECULES
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CHAIKOF EL, 2002, V961, P96, ANN NY ACAD SCI
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LANGER R, 2004, V428, P487, NATURE
LEE J, 2001, V34, P5968, MACROMOLECULES
LEE KY, 2001, V101, P1869, CHEM REV
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LI B, 2001, V305, P592, J MOL BIOL
LI B, 2001, V123, P11991, J AM CHEM SOC
LI B, 2003, V68, P121, BIOPOLYMERS
LIM DW, 2007, V8, P1463, BIOMACROMOLECULES
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MEYER DE, 2004, V5, P846, BIOMACROMOLECULES
MEYER DE, 2002, V3, P357, BIOMACROMOLECULES
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NAGAPUDI K, 2005, V26, P4695, BIOMATERIALS
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Synthesis and characterization of an elastin-mimetic amphiphilic block copolymer protein

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The overall goal in material science is to be able to control the molecular architecture of a material and thus its end properties. There is no method that offers greater control than the biological synthesis of proteins. From the DNA sequence to the final synthesized protein, the entire process is finitely controlled. This present work describes methods developed and used to synthesize protein polymers by manipulating this process. From the initial DNA sequence chosen, the end properties that the protein polymer will have are dictated. An amphiphilic diblock copolymer was designed based on environmentally responsive elastin-mimetic peptide sequences [(Val/Ile)-Pro-Gly-Xaa-Gly] (Xaa = Ala or Glu for the hydrophilic block, Val or Phe for the hydrophobic block) and synthesized using a genetic engineering approach. Differential scanning calorimetry measurements in aqueous solution revealed that reversible hydrophobic folding and assembly of the copolymer occurs above the inverse temperature transition, <italic>T_t</italic>, of the hydrophobic block. This process results in the formation of 50 nm protein-based micellar aggregates, which were characterized by electron microscopy and temperature-dependent dynamic light scattering techniques. The distribution of micellar aggregates can be altered reproducibly through variation of environmental conditions including pH and temperature. The uniform and defined macromolecular architecture of this protein copolymer permits greater control over the physical properties of the micelles, which therefore may facilitate applications in controlled release of small molecules.

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In situ cross-linking of elastin-like polypeptide block copolymers for tissue repair

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Rapid cross-linking of elastin-like polypeptides (ELPs) with hydroxymethylphosphines (HMPs) in aqueous solution is attractive for minimally invasive in vivo implantation of biomaterials and tissue engineering scaffolds. In order to examine the independent effect of the location and number of reactive sites on the chemical cross-linking kinetics of ELPs and the mechanical properties of the resulting hydrogels, we have designed ELP block copolymers comprised of cross-linkable, hydrophobic ELP blocks with periodic Lys residues (A block) and aliphatic, hydrophilic ELP blocks with no cross-linking sites (B block); three different block architectures, A, ABA, and BABA were synthesized in this study. All ELP block copolymers were rapidly cross-linked with HMPs within several minutes under physiological conditions. The inclusion of the un-cross-linked hydrophilic block, its length relative to the cross-linkable hydrophobic block, and the block copolymer architecture all had a significant effect on swelling ratios of the cross-linked hydrogels, their microstructure, and mechanical properties. Fibroblasts embedded in the ELP hydrogels survived the cross-linking process and remained viable for at least 3 days in vitro when the gels were formed from an equimolar ratio of HMPs and Lys residues of ELPs. DNA quantification of the embedded cells indicated that the cell viability within triblock ELP hydrogels was statistically greater than that in the monoblock gels at day 3. These results suggest that the mechanical properties of ELP hydrogels and the microenvironment that they present to cells can be tuned by the design of the block copolymer architecture. (c) 2008 American Chemical Society.

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